

REMARKS

Applicants respectfully request reconsideration of this application as amended.

Claim 16 has been amended as suggested by the Examiner – withdrawal of the objection is respectfully requested.

Regarding the art-based rejection in view of Bornn and Whitmore, the Official Action asserts that Bornn discloses on column 25, lines 8 to 40, selecting one output of sensors provided in the chest region and the abdominal region (see page 4, lines 17 to 19 of the detailed action). However, Bornn does not disclose such a feature.

At column 25 lines 8 to 17, Bornn discloses that capacitor 1614 is connected in parallel to transducer 26, that voltage accumulated at the capacitor is in proportion to the ratio of the piezoelectric transducer film area to the capacitance value, and that the ratio can be selected so as to limit the maximum output voltage (see Fig. 13D).

At column 25, lines 18 to 40, Bornn discloses how the input impedance of buffer amplifier 1616 and the discharge rate of the capacitor 1614 are selected and how the value of resistance 1630 is selected (see Fig. 13D).

As can clearly be seen below, and contrary to the assertions on pg. 4 of the Office Action, Column 25, lines 8 to 40 (reproduced below) of Bornn *does not* disclose selecting one output of sensors provided in the chest region *and* the abdominal region.

A transducer 26 is connected in parallel with a current-to-voltage converting element 1612 such as capacitor 1614. Preferably, the capacitor 1614 is low loss and has a capacitance value, typically from 0.1 .mu.F to 2 .mu.F, which is related to the film area of the transducer. In this manner, the voltage produced across capacitor 1614 is proportional to the ratio of the piezoelectric transducer film area to the capacitance value. The ratio can be selected to limit the maximum output voltage of the combination.

Buffer amplifier 1616 provides a high level input impedance to the transducer 26 and capacitor 1614. The load impedance present by buffering means 1616 to capacitor 1614 is selected so that the discharge rate of capacitor 1614 is much less than the frequency of the motion or movement which is to be monitored, in the case of the present invention, respiration and/or pulse. Where very low frequency motions or movements are to be monitored, the discharge rate will be selected to be ten or 100 times lower than the rate being monitored.

Buffer amplifier 1616 is a differential amplifier connected in a bootstrap/voltage follower mode. Resistor 1630 has an "effective" value which is determined by the ratio of resistor 1628 to resistor

1626 multiplied by the actual value of resistor 1630. Furthermore, amplifier 1618 should have a maximum bias current which is low enough to allow the bootstrapped high impedance (effective value of resistor 1630) to control the discharge rate and the low frequency response characteristics of the transducer system. For example, devices having approximately 75 fempto amps or lower input bias currents would be satisfactory.

There is also no other portion of Bornn that teaches, suggests or discloses selecting one output of sensors provided in the chest region and the abdominal region.

While Bornn does mention selecting one output of the transducers 26A and 26B at the analog multiplexer 1022 in Fig. 13B, Bornn's structure is different from the claimed feature.

In accordance with an exemplary embodiment, several respiratory sensors are provided and one of the most suitable outputs thereof is selected based on the outputs thereof. Therefore, the most suitable one output is selected and the exemplary embodiment can achieve an appropriate measurement.

In complete contrast, Bornn discloses in Fig. 13B to select paired *chest circumference* transducers 26A and 26B in a time-multiplexed fashion - the output of the transducer 26A for pulse and the output of the transducer 26B for respiratory in order to share the A/D converter 1036. Clearly these sensors are both in the chest region - Bornn does not disclose selecting one output of sensors provided in the chest region and the abdominal region. Whitmore fails to overcome these deficiencies.

Accordingly, Applicants respectfully submit the independent claims are clearly patentably distinguishable from the cited references. The dependent claims are further distinguishable at least based on the above and the additional feature(s) cited therein.


A Notice of Allowance is earnestly solicited.

The Commissioner is hereby authorized to charge to deposit account number 19-1970 any fees under 37 CFR § 1.16 and 1.17 that may be required by this paper and to credit any overpayment to that Account. If any extension of time is required in connection with the filing of this paper and has not been separately requested, such extension is hereby petitioned.

Respectfully submitted,

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